METHOD TO IMPROVE MECHANICAL STRENGTH OF LOW-K DIELECTRIC FILM USING MODULATED UV EXPOSURE

ABSTRACT

Methods and apparatus for improving mechanical properties of a dielectric film on a substrate are provided. In some embodiments, the dielectric film is a carbon-doped oxide (CDO). The methods involve the use of modulated ultraviolet radiation to increase the mechanical strength while limiting shrinkage and limiting any increases in the dielectric constant of the film. Methods improve film hardness, modulus and cohesive strength, which provide better integration capability and improved performance in the subsequent device fabrication procedures such as chemical mechanical polishing (CMP) and packaging.